man. In my own garden, where I have had standing always from ten to fifty swarms, and over which I thought I was watching with almost a fatherly affection, I have learned how utterly selfish I was in looking forward to autumn, when, by the destruction of the industrious and unselfish bees, I could lay in for my own consumption what they had so laboriously gathered in the summer to sustain each other through the winter. I learned, from their unselfishness, to divide with them, always leaving enough to sustain the colony till the spring should again bring the flowers.

I think, too, that both Sir John Lubbock and your correspondent are mistaken as to the object of beating pans, sounding horns, and making other hideous noises in hiving bees. The object is not, as Sir John intimates, originally to drive away evil spirits, or to assert ownership, as indicated by Mr. Renshaw. It is simply, as everyone knows who ever thumped on a pan, sounded a horn, or yelled through a speaking trumpet on such an occasion, to drown the voice of the queen or guides who are to conduct the swarm to the new home which members of the community who had been sent out, as the Israelites sent forward Joshua and others, had found for them.

Mr. Renshaw's law is probably good, but does not apply in the case trying. JOSIAH EMERY

City of Williamsport, Pa., U.S.

## Flowering of the Hazel

IT was with great interest that I read the communication from F. D. Wetterhan, in NATURE, vol. xi. p. 507. But I cannot help expressing quite a different opinion as to the bearing of the interesting fact that proterandrous and proterogynous individuals are to be found in the same locality. From the structure of the flowers and from insects never visiting the stigmas, I am convinced that the hazel is a strictly anemophilous plant; that the red colour of its stigmas is solely an effect of chemical processes connected with the development of the female flowers to maturity, just in the same manner as in the female flowers of the larch-tree and some other Coniferæ; and that likewise the coexistence of proterandrous and proterogynous individuals in the hazel relates solely to the influence of the wind, and not at all to the agency of insects.

Whilst in Primula, Pulmonaria, and many other entomophilous plants, so admirably treated of by Charles Darwin, two kinds of individuals, viz., long-styled and short-styled ones, have originated from the positions of the anthers and the stigmas diverging in different individuals in opposite directions—among the anemophilous plants in *Juglans regia* * and *Corylus avellana*, among the entomophilous ones in *Syringa vulgaris* † and *Veronica spicata*, ‡ two kinds of individuals, namely, proterandrous and proterogynous ones, have originated from the periods of development of the anthers and stigmas diverging in different individuals in opposite directions. The effect in the two contrivances has been the same, cross-fertilisation not only between different flowers, but also between different branches, having become indispensable.

In dimorphous species, this cross-fertilisation, as is known, is effected by the visiting insects touching with the same part of their body the anthers of the long-styled and the stigmas of the short-styled form; and with some other part of their body the anthers of the short-styled and the stigmas of the long-styled form. This kind of intercrossing can apparently never be effected by the wind; whence long-styled and short-styled (dimorphous) species are never to be found among anemophilous plants. But in these the coexistence of proterandrous and proterogynous individuals produces the same effect, the pollen-grains of the proterandrous individuals, of course, being transported by the wind only to the stigmas of the proterogynous ones, and *vice versâ*.

Lippstadt, May 1 HERMANN MÜLLER

## Variable (?) Star in Sextans

THE following may be of interest to the readers of your Astronomical Column:—

About 2½° *north* of, and a little *preceding* λ Hydræ (4 mag.), is a star marked 5th mag. in Harding's large *Atlas Novus Cælestis* (1822). This is now invisible to the naked eye, and of about mag. 7. It is 19662 in Lalande's Catalogue, in which it is rated at 4½ mag. It seems difficult to understand how excellent observers like Harding and Lalande could have made a mistake of 2 magnitudes in the estimation of a star's brightness, particularly as it is closely preceded by a 7½ mag. star (Lalande, 19646). So that probably this star has faded since 1822. Its position for the beginning of the present year is in R.A. 9h. 57m. 30·46s., and N.P.D. 98° 58′ 0″·42.

Punjab, India, April 3 J. E. GORE

## Equilibrium in Gases

MR. NICHOLS, in NATURE, vol. xi. p. 486, advances the opinion that in a vertical column of gas at rest the temperature does not tend, as generally believed, to become equal throughout, but that such a column is in a state of thermal equilibrium when the temperature diminishes at the rate of 1° centigrade for every 233 feet of ascent (or 1° Fahr. for every 129 feet). This is a question of thermo-dynamics, and I am not mathematician enough to offer any opinion on it from the theoretical point of view, but it seems inconsistent with well-known meteorological facts. Were it true, there would be, as Mr. Nichols points out, a constantly renewed tendency for the lower strata to flow upwards in consequence of their higher temperature and consequent relative expansion. Such a tendency is no doubt very common, but Mr. Nichols's theory would require it to be universal, and it does not appear to exist in the absence of direct solar heating. Cumulus cloud is an infallible proof of the presence of ascending columns of air, and according to the report of the Austrian Polar Expedition in NATURE, vol. xi. p. 415, cumulus is never seen in the Arctic winter; and I have somewhere read the same respecting the Siberian winter. The true cause of the accumulation of heat in the lower atmospheric strata, to which upward currents and the formation of cumulus is due, is, I have no doubt, that usually assigned—namely, that the atmosphere is more pervious to the heat of the sun than to heat radiated back from the earth; so that, as I think Tyndall expresses it, the sun's heat is caught as in a trap. JOSEPH JOHN MURPHY

Old Forge, Dunmurry, Co. Antrim,
April 30

## Curious Phenomenon of Light

ROWING on Loch Lomond recently, above Luss, there were seen to the north-west, at an apparent distance of about 100 yards, two bright lines of prismatic light, 60° apart and on the level of the water. Their length seemed to equal the breadth of a rainbow. Their violet ends were towards each other, and were joined by a line of dull white light, to the middle of which the sun and the spectator were at right angles. Standing in the boat, the colour and brilliancy were lost, and only a diffuse white light was visible. The time was 10 A.M. The sun was hot, the sky cloudless, the air hazy and still, and the loch a mirror. This apparition fled before our approach for some minutes, till dispelled by a slight breeze, which rippled the water.

Luss WM. M'LAURIN

## Destruction of Flowers by Birds

I ENCLOSE some flowers of the common blackthorn, that I suppose to have been snipped off by birds. The bushes were growing in the outskirts of a wood, in a very sequestered situation (near Dunstable). The upper branches appeared to have chiefly suffered. The grass below was quite conspicuously starred with the fallen blossoms. I can hardly think that human intervention had anything to do with it. R. A. PRYOR

Hatfield, May 5

[In the accompanying specimens the limb of the calyx (carrying the stamens and petals) had been neatly cut away from the tube.]

## *OUR ASTRONOMICAL COLUMN*

ORBITS OF BINARY STARS.—Dr. Doberck, of Colonel Cooper's Observatory, Markree, Co. Sligo, has published the results of a new investigation of the elements of the revolving double star σ Coronæ Borealis, in which measures to the end of 1872 are included. The period of revolution is increased to 843 years, which is longer than any yet assigned to this star. Dr. Doberck's comparison of his orbit with the measures of the late Rev. W. R. Dawes affords another proof of the remarkable excellence of that astronomer's observations, particularly in the last

* Delpino, "Ulteriori osservazioni," Parte II. fasc. ii. p. 337.
† H. Müller, "Befruchtung," &c., p. 339.
‡ Ibid. p. 285.

fifteen years of the period over which they extend, when he had the command of comparatively large telescopes; and a similar remark applies to the measures of Baron Dembowski, who during upwards of twenty years has produced work of the greatest value in this department of astronomy. Dr. Doberck also gives us a provisional orbit for τ Ophiuchi, which Sir William Herschel in 1783 considered the closest of all his double stars; and after appearing single to Struve with the Dorpat refractor in 1825, was oblong in 1827, and is now an easy object. The period assigned is 185 years, with a peri-astron passage, 1820·63; the semi-axis, 1″·11.

THE STAR LALANDE 19662 (SEXTANS).—Mr. J. E. Gore, of Umballa, Punjab, in a letter printed in another column, directs attention to the probable variability of this star. It was observed by Lalande, 1798, April 10, "Histoire Céleste," p. 330, where its magnitude is entered 4½, as in the reduced catalogue published by the British Association (which, by the way, as well as the other two catalogues prepared at the instance of that body, is unfortunately becoming scarce). It appears in Heis's Atlas as a 6·7; but after searching through the modern catalogues where it was likely to be included, we have only discovered a single meridian observation by Lamont in his Zone 314, on 1845, April 5, when it is called 7·8. It does not occur in Argelander's "Uranometria," nor was it observed by D'Agelet, Bessel, or Santini.—Another of Lalande's stars, No. 23726 in Corvus, is in all probability variable. He estimated it 7½, 1795, May 10, and Bessel in May 1824 called it 8; Heis, however, saw it as a *fifth* magnitude. What is the actual degree of brightness? The star's position for the commencement of the present year is in R.A. 12h. 37m. 2s., and N.P.D. 103° 10′·3.

THE STAR 61 GEMINORUM.—The Rev. T. W. Webb has remarked the probable variability of a small companion of this star, distant about 1′, and not far from the circle of declination to the south (estimated angles from 160° to 190°), and appears inclined to identify it with Smyth's companion of the 9th magnitude, for which he gave, 1835·85, position 110°·0, distance 60″. Smyth's estimates of magnitude down to 9 may be generally relied upon, though for smaller stars he is often wide of the mark, according to our present standard. It is very possible that he may have caught one of the minor planets close to 61 Geminorum; his angle, though it has only his lowest weight, differs considerably from recent estimations for the faint star. Our principal object in referring to the Rev. T. W. Webb's remarks is, however, to suggest that 61 Geminorum may be itself variable; D'Agelet considered it 6 in October 1784. Piazzi observed it ten times on the meridian, and estimated it 7·8; it is 7 in Lalande, 6·7 in Taylor's volume for 1834–35, 6 in the "Uranometria" and Heis's Catalogue, 6·5 in "Durchmusterung," and 6·3 in the Radcliffe Observations, 1870. The deep yellow colour noticed by Smyth, and now stated to have disappeared, may perhaps be considered by some readers as an indication in the same direction.

COMETARY ASTRONOMY.—The *Astron. Nach.*, No. 2,034, contains a fine series of observations of the faint comet discovered by Coggia, 1874, August 19, taken at the newly-erected observatory of Col. Tomline, Orwell Park, Ipswich: it extends to the middle of November, and will no doubt be of material service in the final determination of the orbit. (The position of the Orwell Park Observatory is in long. 4m. 55·8s. E., and lat. 52° 0′ 33″). Vienna observations of the same comet appear in No. 2,035 of the above-named periodical, but extend only to October 19: they are accompanied by positions of Winnecke's Comet (1874, April 11) to June 17, and of the comet detected by Borrelly (July 25) to October 19.—In No. 2,036, Dr. Sandberg has given elements of the elliptic comet of Tempel, 1873, II., which will be preferable to any hitherto published. It will be remembered that this comet, near the preceding aphelion passage, experienced very heavy perturbations from the action of Jupiter, having approached that planet in January 1870 within 0·35 of the earth's mean distance from the sun. In the instantaneous ellipse at perihelion, 1867, May 23, the period of revolution was 2,080 days: at the last passage by the same point of the orbit, the perturbations had increased the period to 2,179 days. Other elements for 1873 are: semi-axis major, 3·2889; semi-axis minor, 2·9169; perihelion distance, 1·7695; the period in years is 5·965, so that we may expect to see the comet in the spring of 1879 under similarly favourable conditions for observation to those of 1867 and 1873.—In No. 2,037 we have definitive orbits (parabolic) for Comet 1870, IV., which was observed for only seven days, and of Comet 1871, II., both by Herr Schulhof, of the Observatory at Vienna. As the manner in which the elements are expressed may not be readily understood by the uninitiated in such calculations, we transcribe the orbits in the form that has so far been adopted in our catalogues. The perihelion passage is expressed in Greenwich time, and the longitudes are from mean equinox at commencement of the year.

| | Comet 1870, IV. | Comet 1871, II. |
|---|---|---|
| Perihelion passage ... | Dec., 19·87609 | ... July, 27·01925 |
| Long. of perihelion ... | 4° 8′ 56″ | ... 115° 35′ 44″ |
| ,, ascending node | 94 44 43 | ... 211 54 40 |
| Inclination ... ... ... | 32 43 35 | ... 78 0 36 |
| Log. perihelion distance | 9·590242 | ... 0·031763 |
| Motion ... | Retrograde. | ... Retrograde. |

## *LECTURES AT THE ZOOLOGICAL GARDENS**

### III.

*May* 6.—*Mr. Garrod on the Deer Tribe.*

THE Deer may be defined as those Ruminant Artiodactylate animals in which deciduous horns are developed, and the young are spotted. Some, namely the Musk Deer (*Moschus*) and the Water Deer (*Hydropotes*), never have antlers; in both these the young, however, are spotted, as they are not in any of the hollow-horned Ruminants.

The degree of development of the antlers is closely related to the size of the species. In the small Pudu Deer and the Muntjacs they are simple or but slightly branched; whilst their branching is very considerable in the large Reindeer and Wapiti. The typical antler seems to consist of a main stem or beam, with a small basal, anteriorly directed tyne, the brow antler. The apex of the beam bifurcates, one branch being directed forwards, and a little external to the brow antler; the other starts from the inner side of the posterior surface. In one well-marked group, the *Elaphine*, the anterior of these upper branches is inconsiderable and does not branch, the posterior enlarging and branching in most—becoming palmated in the Fallow Deer. The larger species of this elaphine section, including the Wapiti, Maral and Red Deer, possess a second brow antler; whereas in the smaller species this is not found (*e.g.* the Fallow, Formosan, Mantchurian, and Japanese Deer). In the Mesopotamian Deer, recently discovered by Sir Victor Brooke, which is intimately related to the Fallow, the palmation is found in the basal portion of the antler, including the brow antler, together with extra small tubercles very frequently found in that region.

In the group of Deer called *Rusine* the bifurcation is more equal, and when there is a further branching, the anterior as well as the posterior branch participates in the division. The brow antler is simple. This type of antler is found in its most uncomplicated condition in the Sambur of India, and the closely allied species *Rusa equinus*, *swinhoii*, &c. of the Malay region and

* Continued from p. 9.